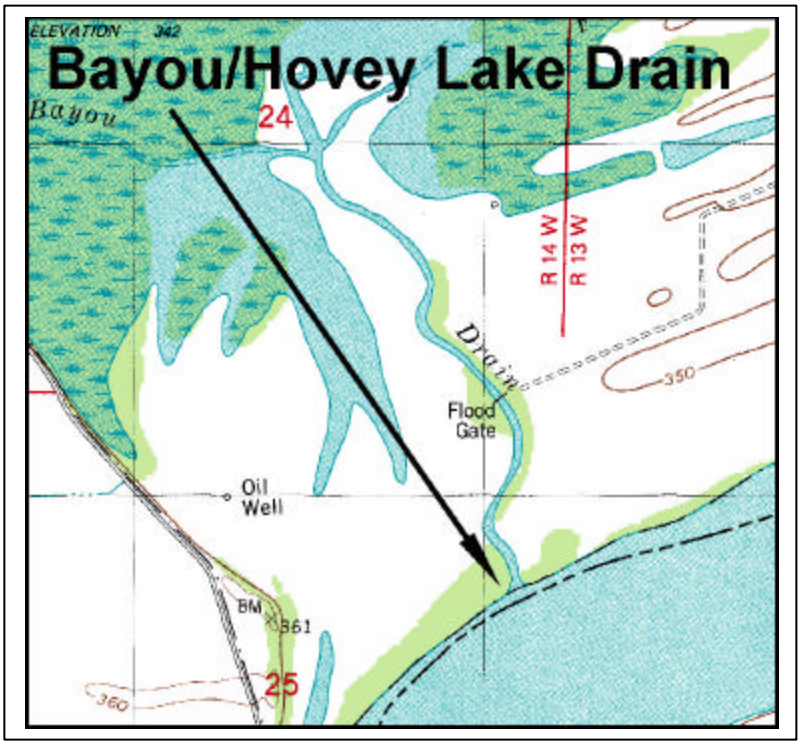
BAYOU/HOVEY LAKE DRAIN (IN-09)

1.0 Location

The proposed Bayou/Hovey Lake Drain project area is located in Posey County, Indiana, and approximately 2-3 miles north of Uniontown, Kentucky. The project area is near the Ohio River Meyer's Pool at approximately Ohio River Mile (ORM) 840.7. The project site is within the jurisdiction of the Louisville District, U.S. Army Corps of Engineers (USACE).



2.0 Project Goal, Description, and Rationale

The primary goals of the Bayou/Hovey Lake Drain project include restoration of the existing embayment to enhance fish and wildlife habitat. The restoration of backwater areas will provide reproductive, feeding, nursery, high water refuge, seasonal migration, and overwintering habitat for many fish species. The project involves the dredging of 50% of the surface area upstream to the Hovey Lake water control structure to an average depth of 12 feet at the USACE normal pool level.

Ohio River embayments have historically provided important and diverse off-channel habitat for many fish species. Over the years many of the embayments have silted in and no longer maintain the quality or diversity of habitat previously provided. The restoration of Bayou/Hovey Drain will result in improved off channel habitat within the Myers Pool of the Ohio River.

Bayou/Hovey Aerial View

3.0 Existing Conditions

Terrestrial/Riparian Habitat: Bayou/Hovey Drain is located within the Hovey Lake Fish and Wildlife Area (FWA). A riparian forest band is present from the Hovey Lake outlet structure to the confluence with the Ohio River. Silver maple (*Acer saccharinum*) and other light mast producing trees are common along the banks of the embayment. Adjacent to the riparian forest are agricultural areas primarily used for wildlife management activities at Hovey Lake FWA.

Aquatic Habitats: The aquatic habitat within the portion of Bayou/Hovey embayment below the Hovey Lake drain consists of a diverse assemblage of deep and shallow water with abundant instream cover. A large scour hole (18-30 feet deep) exists immediately below the Hovey Lake drain. Most of the remainder of the embayment has main channel water depths ranging from 8 to 14 feet deep under normal pool conditions. Instream cover in the area consists of fallen trees and boulders. Near the mouth of the embayment water depths are shallow ranging from 1 to 3 feet in depth. During periods of low river stage access to the embayment maybe limited by the shallow depth at the mouth of the embayment.

Bayou/Hovey Embayment

Bayou/Hovey at Hovey Drain

Mouth of Bayou/Hovey

Wetlands: Other than the bottomland hardwoods associated with the riparian zone, there are no jurisdictional wetlands present in the immediate vicinity of the proposed Bayou/Hovey Embayment project area.

Federally-Listed Threatened and Endangered Species: According to the U.S. Fish and Wildlife Service (USFWS), there are 11 federally-listed endangered species and 1 federally-listed threatened species known to occur in Posey County, Indiana. These species are listed on Table 1.

Table 1. Federally-listed species known to occur in Posey County, Indiana.

Common Name	Scientific Name	Federal Status	Potential Habitat Present
Indiana bat	*Myotis sodalis*	Endangered	Yes
Bald eagle	*Haliaeetus leucocephalis*	Threatened	Yes
Eastern fanshell pearly mussel	*Cyprogenia stegaria*	Endangered	No
Tubercled blossom mussel	*Epioblasma torulosa torulosa*	Endangered	No
Pink mucket pearly mussel	*Lampsilis abrupta*	Endangered	No
Ring pink mussel	*Obovaria retusa*	Endangered	No
White wartyback mussel	*Plethobasus cicatricosus*	Endangered	No
Orange-foot pimpleback mussel	*Plethobasus cooperianus*	Endangered	No
Clubshell mussel	*Pleurobema clava*	Endangered	No
Rough pigtoe mussel	*Pleurobema plenum*	Endangered	No
Fat pocketbook mussel	*Potamilus capax*	Endangered	No
American burying beetle	*Nicrophorus americanus*	Endangered	No

Source: U.S. Fish and Wildlife Service, 1999

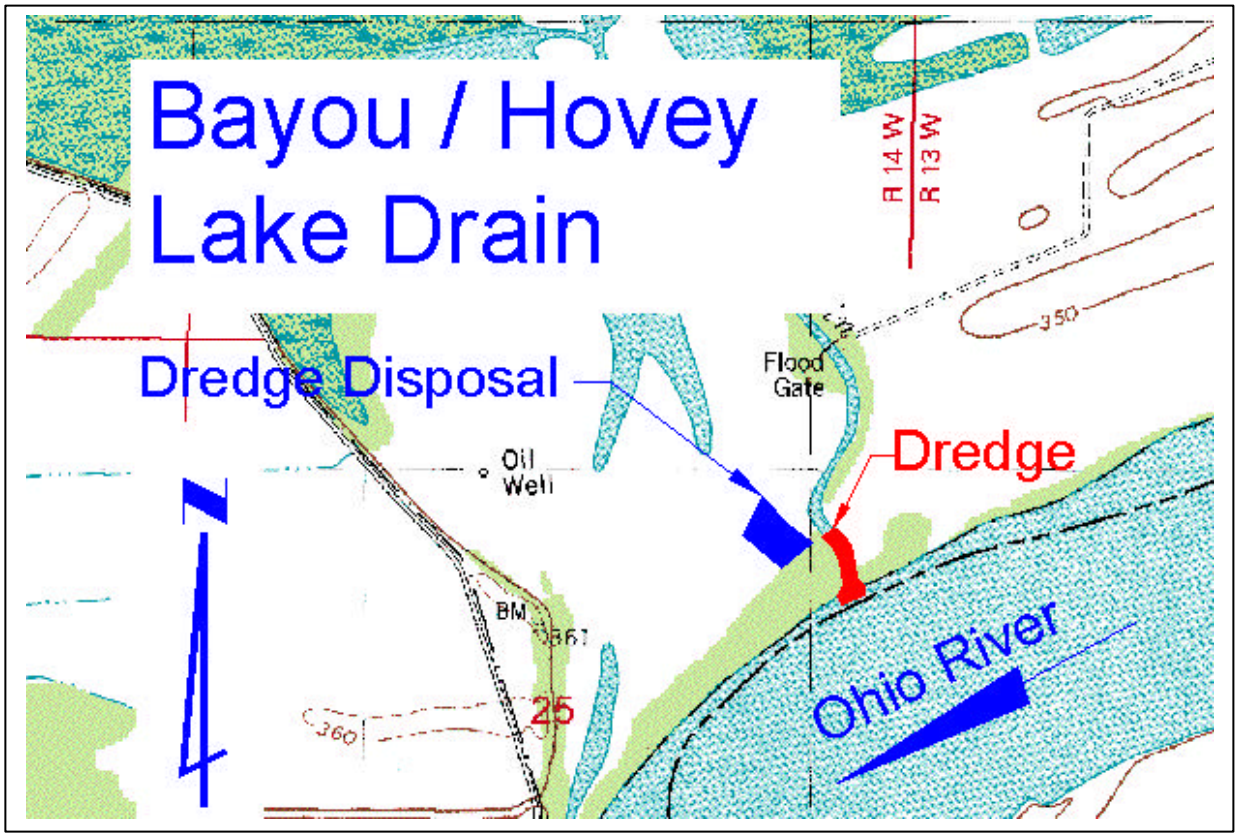
The riparian corridor adjacent to the Ohio River may provide summer roost habitat for the Indiana bat. Preferred tree species would include a mixture of oaks (*Quercus* spp.), silver maple (*Acer saccharinum*), cottonwood (*Populus deltoides*), and shagbark hickory (*Carya ovata*) (INHS, 1996). The riparian corridor would also provide feeding/foraging habitat for the Indiana bat.

Bald eagles may utilize forested areas for roosting/perching habitat and feed in the open water areas. Although bald eagles nest at Hovey Lake FWA it is unlikely that any eagle nests exist in the immediate vicinity of the Bayou/Hovey embayment project area.

All of the mussels are freshwater species that typically inhabit medium to large river systems. The mussels are typically found in habitats with substrates that range from silt to gravel, and in water depths from 0.5 to 8.0 meters. These species are generally associated with moderate to fast flowing water. There does not appear to be suitable habitat for these species in the immediate vicinity of the project area.

The American burying beetle is generally associated with upland habitats such as grassland prairie, forest edge, and shrubland. It is unlikely that the beetle would be found on the project area.

4.0 Project Diagram



5.0 Engineering Design, Assumptions, and Requirements

5.1 Existing Ecological/Engineering Concern

The Bayou/Hovey Lake Drain has filled with sediments due to several factors. These factors include: raised water levels from the impoundment of the Meyers Pool; deposition of Ohio River silt-laden waters, especially during flood events; wave action from barge traffic.

5.2 Embayment Dredging

Maintenance dredging of the mouth of the embayment is required to provide deep water connectivity to the remainder of the embayment and to provide a suitable depth for boater access. The dredging will be at a 3:1 slope resulting in an embayment approximately 1.6 acres in size, sloping from the shoreline to approximately 12 feet in depth along the centerline of the channel. An estimated 13,100 cubic yards of silty-clay material would be dredged to restore depths of 9-12 feet in the embayment mouth. A dredge disposal site is adjacent to the embayment, with a natural swale. A small levee, 4 feet high and 300 feet in length, would be constructed at the designated disposal site for dewatering.

5.3 Planning/Engineering Assumptions

- A small auger head dredge would be used, and the material would be pumped directly to the disposal site.
- Bottom side slopes will be reshaped to a 3:1.

- All the material required for the levee would be taken from on site.
- A 2,320 gallons per minute (gpm) centrifugal pump would be used for dewatering. Dewatering would commence 18 days after dredging begins to prevent the dewatering basin from exceeding capacity.

6.0 Cost Estimate (Construction)

Dredging - Engineering costs for the proposed project are contained on Table 1. A detailed MCACES cost estimate for the proposed project is included in Appendix C.

Table 1. Engineering Costs.

Item	Cost
Dredging	$16,500
Levee	$5,900
Dewatering	$7,200
Mobilization	$15,200
TOTAL	**$44,800**

7.0 Schedule:

Bayou/Hovey Embayment Dredging: The estimated construction time for this project is shown on Table 2.

Table 2. Construction Schedule.

Item	Time
Dredging	18 Days
Levee	4 Days
Dewatering	6 Days
Mobilization	4 Days
TOTAL	**32 Days**

8.0 Expected Ecological Benefits

Terrestrial/Riparian Habitats: The impacts of the Bayou/Hovey Lake Drain project would primarily be in-stream. There would be no reasonable foreseeable beneficial impacts to terrestrial/riparian resources as a result of implementing the proposed project.

Aquatic Habitats: Long-term beneficial impacts to aquatic resources would be anticipated as a result of implementing the proposed project. Dredging the embayment would improve over-wintering habitat for many fish species and improve access to the embayment during periods of low river stage.

Wetlands: There would be no foreseeable beneficial impacts to jurisdictional wetlands as a result of implementing the proposed project.

Federally-Listed Threatened and Endangered Species: There would be no reasonably foreseeable beneficial impacts to federally-listed threatened or endangered species as a result of implementing the proposed project.

Socioeconomic Resources: There would be minor short-term and long-term beneficial impacts to socioeconomic resources as a result of implementing the proposed project. The short-term beneficial impacts would be related to costs and local expenditures associated with

the construction/dredging of the embayment. Long-term socioeconomic benefits would be realized through improved recreational fishing opportunities. Long-term indirect beneficial impacts will be realized through local expenditures for fishing tackle, food, gas, and other associated needs.

9.0 Potential Adverse Environmental Impacts

Terrestrial/Riparian Habitats: There would be potential short-term adverse impacts to terrestrial/aquatic resources as a result of implementing the proposed project. There would be short-term adverse impacts to terrestrial species from construction-related noise and disturbance. There would be short-term adverse impacts to the land designated as the dredge material disposal site. Adverse impacts to the dredge material disposal site would be considered short term, because it is assumed that the site can be re-vegetated following the de-watering and grading of the spoil material.

Aquatic Habitats: There would be a potential for adverse environmental impacts to aquatic species, especially immobile benthic invertebrates and young-of-year fishes during the dredging of the embayment. Localized populations of benthic invertebrates could be directly disturbed during the dredge operation. In addition, sensitive aquatic species immediately downstream from the site could be adversely impacted by increased water turbidity associated with displaced sediments.

Wetlands: There would be no foreseeable adverse impacts to jurisdictional wetlands as a result of implementing the proposed project.

Federally-Listed Threatened and Endangered Species: There would be potential for short-term adverse impacts to the bald eagle from construction related noise and disturbance. These impacts would be minor for the bald eagle, unless nesting areas are nearby, which could create the potential for nest abandonment. There would be no foreseeable adverse impacts to the Indiana bat as a result of implementing the proposed project. There would be a slight potential for adverse impacts to the endangered mussel species during the dredging of project site. Mussels immediately downstream from the dredge site could be adversely impacted by perturbed water quality conditions associated with displaced sediments. There are no foreseeable adverse impacts to the American burying beetle as a result of implementing this project.

Socioeconomic Resources: There would be no reasonably foreseeable adverse socioeconomic impacts as a result of implementing the proposed project.

10.0 Mitigation

Minor impacts associated with site restoration may occur during the construction of this project, however, no significant adverse impacts are expected. The use of best management practices and proper construction techniques would minimize adverse water quality impacts.

If determined to be appropriate by USFWS, a mussel study could be completed near the mouth of Bayou/Hovey prior to dredging to confirm the presence or absence of endangered mussel species within the project area.

11.0 Preliminary Operation and Maintenance Costs: Operation and maintenance costs are summarized on Table 4.

Table 4. Operation and Maintenance Costs		
Maintenance	**Frequency**	**Costs**
Maintenance Dredging	25 years	$10,000

12.0 Potential Cost Share Sponsor(s)

- Indiana Department of Natural Resources
- The Nature Conservancy
- Ducks Unlimited
- Local Economic Development Council
- Private corporations
- Local marinas
- Indiana Bass Federation
- Local BASS Chapters
- Local and County Governments

13.0 Expected Life of the Project

It is anticipated that the dredging operation would provide meaningful depths for fishes in the embayment for approximately 25-30 years before additional dredging would be necessary.

14.0 Hazardous, Toxic, and Radiological Waste Considerations

Potential impacts of hazardous, toxic, and radiological waste (HTRW) at the site were visually assessed during a site visit.

Site Inspection Findings.

The project area consists of the Hovey Lake Bayou/Drain, which is located in Posey County Indiana at Ohio River mile 840.7. Hovey Lake is an oxbow lake formed by a meander cutoff of the Ohio River. Uniontown, Kentucky is the nearest town to the project area and is located south across the Ohio River from Hovey Lake.

The following environmental conditions were considered when conducting the project area inspection on June 29, 1999:

- Suspicious/Unusual Odors;
- Discolored Soil;
- Distressed Vegetation;
- Dirt/Debris Mounds;
- Ground Depressions;
- Oil Staining;
- Above Ground Storage Tanks (ASTs);
- Underground Storage Tanks (USTs);
- Landfills/Wastepiles;
- Impoundments/Lagoons;
- Drum/Container Storage;
- Electrical Transformers;
- Standpipes/Vent pipes;
- Surface Water Discharges;
- Power or Pipelines;
- Mining/Logging; and
- Other

None of the environmental conditions listed above were observed on the project area.

15.0 Property Ownership & River Access

Selected data on properties immediately adjacent to or within each concept site was collected from the county courthouse of the respective county of each site. Data collected included map and parcel identification number, property owner's name and mailing address, acreage of the potentially affected parcel, and market value of the parcel. This procedure involved obtaining a plat or parcel map of the site and surrounding area which identified each parcel with a corresponding map and parcel number. The map\parcel identification number was subsequently used to determine the property owner's name and mailing address from records in the County Assessor's or County Auditor's office. Plat\parcel maps were collected for each site.

The market value of each parcel as contained in the property tables reflects the assessed valuation to supposedly market value ratio used in each State for taxation purposes. These assessed values reflect 1998 assessments. The assessed valuation ratio is 33.3 percent for Indiana.

The above ratios were used to approximate the market value of each property. However, in many instances the resultant market value calculated under the above procedure is considerably below the actual value of the land in the real market. Local real estate brokers could provide a more accurate estimate of actual land values.

The collected property data indicate that public lands are adjacent to the Bayou/Hovey Lake Drain. No private lands will be needed or disturbed for this project. The disposal of dredge material will be on federally owned property.

Table 5. Property Characteristics

Site Name: Bayou/Hovey Lake Drain
Location: Posey County, Indiana

Map/Parcel Number	Owner	Mailing Address	Market Value	Acreage
391/02	United States Government (formerly Weyerbacher property)			135.00
391/04-01	(same)			93.62

* Denotes improvements on property.

16.0 References

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Sheaffer, 1986	Sheaffer, W.A. and J.G. Nickum. 1986. Backwater areas as nursery habitats for fishes in Pool 13 of the Upper Mississippi River. Hydrobiology No. 136 pp. 131-140.
Sheehan, 1994	Sheehan, R.J., W.M. Lewis, and L.R. Bodensteiner. 1994. Winter habitat requirements and overwintering of riverine fishes. Fisheries Research Laboratory, Southern Illinois University, Carbondale, Illinois. Final Report F-79-R-6.
USFWS, 1983	U.S. Fish and Wildlife Service, 1983. Northern States Bald Eagle Recovery Plan. USFWS Denver, Colorado

USFWS, 1983	U.S. Fish and Wildlife Service, 1983. Recovery Plan for the Indiana bat (*Myotis sodalis*).
USFWS, 1984	U.S. Fish and Wildlife Service, 1984. Recovery Plan for the Orange-footed Pearly Mussel, Plethobasus cooperianus. Prepared by S. Ahlstedt for USFWS Region 4 August 30, 1984. 46pp.
USFWS, 1985	U.S. Fish and Wildlife Service, 1985. Recovery Plan for the Tuberculed-blossom Pearly Mussel, *Epioblasma torulosa torulosa*, Turgid-blossom Pearly Mussel, *Epioblasma turgidula*, Yellow-blossom Pearly Mussel, *Epioblama florentina florentina*. USFWS Atlanta, Georgia. 42pp.
USFWS, 1985	U.S. Fish and Wildlife Service, 1996. Recovery plan for the pink mucket pearly mussel. USFWS Atlanta, Georgia.
USFWS, 1991	U.S. Fish and Wildlife Service, 1991. Recovery Plan for Ring Pink Mussel (*Obovaria retusa*). Prepared by R.G. Biggins for the Southeast Region USFWS February, 1991. 24pp.
USFWS, 1991	U.S. Fish and Wildlife Service, 1991. Fanshell Recovery Plan. Prepared by R.G. Biggins for the Southeast Region USFWS July 9, 1991. 37pp.
USFWS, 1994	Recovery Plan for the Clubshell (*Pleurobema clava*), Northern Riffleshell (*Epioblasma torulosa rangiana*). Prepared by G.T. Watters for USFWS Region 5, Hadley, Massachusetts. 57pp.
USFWS, 1997	U.S. Fish and Wildlife Service, 1997. Species Accounts: pink mucket pearly mussel (*Lampsilis abrupta*).
USFWS, 1999	U.S. Fish and Wildlife Service, July 1, 1999. Federally Listed Endangered and Threatened Species in Indiana.

APPENDIX A Threatened & Endangered Species

APPENDIX B Plan Formulation and Incremental Analysis Checklist

Project Site Location:

The proposed Bayou/Hovey Lake Drain project area is located in Posey County, Indiana, and approximately 2-3 miles north of Uniontown, Kentucky. The project area is near the Ohio River Meyer's Pool at approximately Ohio River mile 840.7. The project site is within the jurisdiction of the Louisville District, U.S. Army Corps of Engineers (USACE).

Description of Plan selected:

Ohio River embayments have historically provided important and diverse off-channel habitat for many fish species. Over the years many of the embayments have silted in and no longer maintain the quality or diversity of habitat previously provided. The primary goals of the Bayou/Hovey Lake Drain project include restoration of the existing embayment to enhance fish and wildlife habitat. The restoration of backwater areas will provide reproductive, feeding, nursery, high water refuge, seasonal migration, and overwintering habitat for many fish species. The project involves the dredging of 50% of the surface area upstream to the Hovey Lake water control structure to an average depth of 12 feet at the USACE normal pool level.

Alternatives of the Selected Plan:

Smaller Size Plans Possible? **Yes** and description

Reduce the amount of dredging.

Larger Size Plan Possible? **Yes** and description

Increase the amount of dredging.

Other alternatives? **No**

Restore/Enhance/Protect Terrestrial Habitats? No **Objective numbers met**

Restore, Enhance, & Protect Wetlands? No **Objective numbers met**

Restore/Enhance/Protect Aquatic Habitats? Yes **Objective numbers met** A1

Type species benefited: Variety of Ohio River fish species.

Endangered species benefited: None

Can estimated amount of habitat units be determined: Approximately 1.6 acres of the embayment will be restored.

Plan acceptable to Resources Agencies?

U.S. Fish & Wildlife Service?

State Department of Natural Resources? Yes – Indiana DNR

Plan considered complete? **Connected to other plans for restoration?**

Real Estate owned by State Agency? Yes **Federal Agency?** Yes
Real Estate privately owned? No
If privately owned, what is status of future acquisition Not required

Does this plan contribute significantly to the ecosystem structure or function requiring restoration? What goal or values does it meet in the Ecosystem Restoration Plan?

Restoration provides habitat diversity, spawning habitat, nursery habitat, over-wintering habitat, and winter velocity shelters for fishes.

Is this restoration plan a part of restoration projects planned by other agencies? (i.e. North American Waterfowl Management Plan, etc.)

No

In agencies opinion is the plan the most cost effective plan that can be implemented at this location?

Can this plan be implemented more cost effectively by another agency or institution?
Yes / No
Who:

From an incremental cost basis are there any features in this plan that would make the project more expensive than a typical project of the same nature? For embayment type plans is there excessive haul distance to disposal site? More expensive type disposal? Spoil that requires special handling/disposal?

Potential Project Sponsor:

Government Entity:_____
Non-government Entity _____

Corps Contractor _____Date_____

U.S. Fish & Wildlife Representative _____Date_____

State Agency Representative _____Date _____

U.S. Army Corps of Engineers Representative _____Date _____

Terrestrial Habitat Objectives

T1 Riparian Corridors

T2 Islands

T3 Floodplains

T4 Other unique habitats (canebrakes, river bluffs, etc.)

Wetland Habitat Objectives

W1 Forested Wetlands: Bottomland Hardwoods

W2 Forested Wetlands: Cypress/Tupelo Swamps and other unique forested wetlands

W3 Scrub/Shrub Emergent Wetlands: isolated from the river except during high water and contiguous (includes scrub/shrub wetlands in embayments and island sloughs)

Aquatic Habitat Objectives

A1 Backwaters (sloughs, embayments, oxbows, bayous, etc.)

A2 Riverine submerged and aquatic vegetation

A3 Sand and gravel bars

A4 Riffles/Runs (tailwaters)

A5 Pools (deep water, slow velocity, soft substrate)

A6 Side Channel/Back Channel Habitat

A7 Fish Passage

A8 Riparian Enhancement/Protection

APPENDIX C Micro Computer-Aided Cost Engineering System (MCACES)